

SAFIT

SOUTHWEST ASSOCIATION OF FRESHWATER INVERTEBRATE TAXONOMISTS

Welcome to our second volume!

The SAFIT Annual Meeting was held 21 November 2008 and great things happened. We welcome Raphael Mazor as our newly elected Treasurer. Rafi is replacing Ken Schiff, who will be missed for his advice and expertise on the board of directors. Ken was greatly instrumental in founding SAFIT. The board is looking forward to Rafi joining the team.

An editorial board was formed to help with the development and review of the Newsletter. Our editorial board now consists of D. Christopher Rogers, Brady Richards and Jon Lee. We hope that we will be able to improve the format and content of the Newsletter.

The SAFIT website www.safit.org was unveiled amidst oohs and ahhs at the meeting. Kudos to the website committee, as well as the IT staff of ABC Labs for getting this up and running!

The STE committee will be expanding the STE in 2009 to cover the remaining SAFIT geographical region, namely, Utah. The updated STE will incorporate the accumulated STE changes, which in the interim are posted on the SAFIT Website. In addition, the SAFIT officers will be contacting water quality oriented agencies in Nevada, Arizona and Utah to establish the SAFIT STE as the recognized standard for their programs as well.

Have a job opening that you want to announce, or are looking for a job? Let SAFIT know in the Newsletter! Looking for specimens of a certain species or a literature reference? Need material for research or comparative purposes? Let your colleagues know in the SAFIT Newsletter! Want a workshop on a particular group of organisms? Have references to sell, trade or share? Looking for a collecting partner? Put it here in the SAFIT Newsletter! All appropriate requests, queries, non-commercial advertisements and announcements will be considered, and are free to the SAFIT membership.

Thanks!

The SAFIT Board

ANNOUNCEMENTS

World Conference on Biological Invasions and Ecosystem Functioning (BIOLIEF). The BIOLIEF conference will be devoted to the presentation of works concerning the biology, ecology and population dynamics of biological invasions. The BIOLIEF conference will try to

cover as many ecosystems and kingdoms as possible, giving each one of them equal importance in the definition of the final program. So, BIOLIEF would like to invite you to submit an abstract to BIOLIEF. The deadline to submit an abstract, either for poster or oral communications, is 31 May 2009. The BIOLIEF conference will be held in Porto, Portugal, classified by UNESCO as a World Heritage Site. For further details you can visit the webpage www.ciimar.up.pt/biolief.

SAFIT MEETINGS

Workshops in the Works: SAFIT has a number of workshops in the planning stages for this year and years to come. If you have any workshop ideas, please submit them to Joe Slusark (jslusark@csuchico.edu, 530.898.4792) or Christopher Rogers (crogers@ecoanalysts.com, 530.756.4481). We are currently working towards: Western Ephemeroptera, Western Aquatic Mites, Western Aquatic Gastropods, Western Trichoptera, Endangered Species and Bioassessment, Seasonal Wetland Invertebrates, field techniques, and Quality Control Procedures. We are also considering some focused workshops on specific families or genera.

OTHER NEWS

The 2009 NABS (North American Benthological Society) meeting will be held in Grand Rapids, Michigan <http://www.benthos.org/index.cfm> 17 - 22 May. Please check the NABS website for updates and registration opening.

A workshop entitled **The Anostraca and Notostraca of Oregon, Washington and California with emphasis on the federally listed species** will be held 29-31 May 2009; 9:00 A.M. to 5:00 P.M., (4:00 PM on 31 May) at the Davis Public Library (Mary L. Stephens Branch), Blanchard Room, Davis, CA (<http://www.yolocounty.org/Index.aspx?page=256>). For those just interested in the first day lecture portion, the cost is \$50, otherwise the full three day course is \$500. The first day lecture is on Branchiopod crustacean biology, ecology, zoogeography, and conservation, followed by a discussion of fairy shrimp and tadpole shrimp morphology. Fairy shrimp and tadpole shrimp will be examined and identified. This will include a slide show of photomicrographs of the species illustrating key characters. The second day students will continue study. On the third day students will take a practical open book examination during which they will identify a set of test specimens. This test is only required for those who intend to apply for a permit from the US Fish & Wildlife Service to conduct shrimp surveys. For more information, contact D. Christopher Rogers 530.383.4798; crogers@ecoanalysts.com.

The **Florida Association of Benthologists** Spring 2009 taxonomic workshop will be held on May 4th-6th, featuring Dr. Ken Tennessen presenting lecture and hands-on laboratory sessions on Odonata larvae identification. Dr. Tennessen received his Ph.D. in entomology from the University of Florida in 1975, and his special research subjects have long been dragonflies, which he has studied all over the world, resulting in the largest collections of Odonata specimens and photos in western North America. He has written over 40 scientific papers on the Odonata, a booklet on the Dragonflies of Washington, and field guides to North American dragonflies and damselflies. This workshop will be held at the University of Florida Department of Entomology and Nematology-Building 970, Natural Area Drive, University of Florida, Gainesville, FL, 32611. FAB Workshop Link: http://www.flbenthos.org/cgi-bin/cp-app.cgi?usr=51H6445324&rnd=1459120&rrc=N&aff=&cip=65.83.116.10&act=&aff=&pg=cat&ref=2009_spring_workshop&catstr=HOME:annual_meetings Workshop has a maximum of 30 seats, first come first serve basis. Please register on-line (\$70.00 for current members-\$80.00 for non members-\$45.00 for students). This does include membership fees for the 2009 calendar year (of \$30.00). FAB Registration Link: http://www.flbenthos.org/cgi-bin/cp-app.cgi?usr=51H6445324&rnd=252714&rrc=N&aff=&cip=65.83.116.10&act=&aff=&pg=prod&ref=registration_form Once registered on-line please print your on-line order confirmation page and mail your check (payable to FAB) to: Marianne Pluchino, FAB Treasurer, 4506 South Hampton Drive, Orlando, Florida 32812. This information is also provided on the on-line order confirmation page. And as always . . . we will accept payments (check or cash only) at the door during registration. Accommodation/Information: A block of rooms have been reserved under the Florida Association of Benthologists for a discounted rate of \$89/night at the Cabot Lodge-Gainesville, 3726 SW 40th Boulevard, Gainesville, Florida 32608, Phone: (352) 375-2400, Toll-Free: (800) 843-8735, <http://www.cabotlodgegainesville.com>. You MUST reserve room by April 13th to be able to book under this rate.

SCAMIT has the following events planned: March 9 and 10, at the Los Angeles County Museum of Natural History (LACMNH), 9:30-3:30. **A two day review of Cumacea** by Drs. Les Watling and Sarah Gerken. Once again a review of that chapter in Light and Smith's Manual will be part of the meeting. Please bring any specimens you need help with. April ? at LACMNH 9:30-3:30. Dr. Regina Wetzler, LACMNH, is hosting a **peracarid meeting at Catalina Island** in early April. There will be several experts in various peracarid groups attending and Leslie Harris will be arranging a SCAMIT meeting with one of them. Further information will be forthcoming as a date and topic are determined. Stay tuned. **Discussion of cirratulids**, a long overdue topic, will finally begin Tuesday, May 26, at Orange County Sanitation Districts Monitoring Laboratory, 9:30-3:30. We will begin with a review of the following genera; *Cirratulus*, *Cirriformia*, *Protocirrinieris*, and *Timarete*. Tony Phillips will be leading the meeting. Bring your voucher specimens, voucher sheets, and literature to the meeting for a complete review on these genera. **Echinoderms 101** will be presented as a training workshop by Megan Lilly, June 8, at City of San Diego Environmental Monitoring Laboratory, 9:30-3:30. She will present an introduction to the four classes of echinoderm with a review of the major morphological features used to identify them. This will be the second such training workshop. The first, Bivalves 101, last May was very well attended. We plan to present a

continuing series of introductory training workshops covering the major phyla, then move on to a more detailed series covering the classes and orders within those phyla. Dan Ituarte and others at the CSD lab will lead a **photography workshop focusing on taking editing digital images** July 13, at City of San Diego Environmental Monitoring Laboratory, 9:30-3:30. This will be a great opportunity to learn about the tools and tricks needed to produce great images. Those who are involved in documenting species photographically will want to plan on attending this workshop.

The following full-immersion courses in marine science are available this summer at the **Friday Harbor Labs of the Florida Museum of Natural History**. Applications are due February 1; see <http://depts.washington.edu/fhl/studentClasslist2009.html> For more information, contact Gustav Paulay at the Florida Museum of Natural History, University of Florida, Gainesville FL, paulay@flmnh.ufl.edu 1 (352) 273-1948:

Marine Invertebrate Zoology: Comparative biology of marine invertebrate animals, focusing on morphology, natural history, functional biology, life history, and evolutionary relationships. Two daily lectures will provide overviews of the major and many smaller phyla, but the heart of the course comprises study of living animals in the laboratory and fieldwork in the diverse marine habitats surrounding San Juan Island. Applications are welcome from undergraduate students, post-baccalaureates and graduate students. Prior coursework in invertebrate biology or animal diversity is advisable but not essential.

Comparative Invertebrate Embryology: We will provide extensive hands-on laboratory experience with the fertilization and development of most invertebrate phyla including: Cnidaria, Ctenophora, Platyhelminthes, Nemertea, Brachiopoda, Phoronida, Bryozoa, Mollusca, Polychaeta, Chaetognatha, Echinodermata, Hemichordata, and Urochordata. Lectures will focus on cellular and molecular analysis of evolutionary changes in development as well as reproduction and gametogenesis. We will emphasize morphological processes and discuss similarities and differences in embryos and how they develop. Several field trips will acquaint students with the rich invertebrate fauna of the San Juan Islands. We will read and critique original literature on Comparative Embryology. The class is at the graduate student level, but exceptionally qualified undergraduate students are also admitted.

Call for proposal of papers for an international symposium: **Conservation Biology of Freshwater Crayfish**. The symposium will be held at Ikebukuro Sunshine City, Tokyo, Japan, 20 September 2009. This symposium is open to everyone who is interested in freshwater crayfish, from amateur naturalists, private companies, government agencies, and professional researchers. The official language will be English. This symposium will be held as a satellite symposium of The Crustacean Society Summer Meeting in Tokyo, Japan (20-24 Sept.), although it is financially independent. The submitted abstracts of the proposed papers will be under peer review by the organizing committee of this symposium, and accepted papers will be presented at the symposium. Presentation should be in any subject and aspects of conservation biology of crayfish. Each presentation is allotted 30 minutes, including a few minutes discussion. Each speaker will be financially supported to the hotel accommodation close to the venue (a room for one person, three nights around 20 Sept. 2009) and one economy-class, round-trip,

discount ticket (for example, IATA-PEX, ZONE-PEX, APEX, IIT, and GIT). For more information please visit: <http://wwwsoc.nii.ac.jp/cs4/TCSFirstPage1.html>. Deadline for the submission is 15 January 2009. We plan to publish a proceedings volume after the symposium.

NEW BOOK

Stark, B., C. Froehlich, & M. del Carmen Zuniga. 2009. South American Stoneflies (Plecoptera). Aquatic Biodiversity in Latin America Vol. 5, ISBN: 978-954-642-458-7 (HB), ISBN: 978-954-642-459-4 (e-book). 165x240, richly illustrated, keys both in English and Spanish, references, index. In English. Hardcover, 154pp. Price: EUR 60.00

ORDER ONLINE at <http://pensoft.net/newreleases/14385.htm> OR send order to orders@pensoft.net OR fax +359-2-8704282

This book covers the known Plecoptera fauna of South America consisting of six families and 47 genera. It presents updated keys to families and genera in English and Spanish and data on each of these, including a species list of each genus. Complete reference data on the Plecoptera of South America is offered as well as data for each genus considering its status, characters, biology and distribution when available. This book is addressed to specialists in systematics, ecology, limnology, entomology and biology in general.

EMPLOYMENT OPPORTUNITIES

Taxonomist Positions

EcoAnalysts, Inc. has **job openings for a macroinvertebrate taxonomist and a periphyton taxonomist, as well as lab tech positions**. The lab tech positions and the macroinvertebrate taxonomist positions are in the Moscow, Idaho office and the periphyton taxonomist position would be in either Moscow, Idaho or Joplin, MO. The full details are available at <http://ecoanalysts.com/>.

LATEST LITERATURE

If you know of any literature or if you yourself have published any papers of interest to the SAFIT membership, please send copies or the citations to D. Christopher Rogers (crogers@ecoanalysts.com) for inclusion in the next issue of the SAFIT Newsletter. Thanks!!

General

- Audzijonyte, A., K. L. Wittmann, I. Ovcarenko, & R. Vainola. 2009. Invasion phylogeography of the Ponto-Caspian crustacean *Limnomysis benedeni* dispersing across Europe. *Diversity and Distributions*, 15: 346-355.
- Baumann, R.W. & J. P. Hudson. 2009. *Lethocerus americanus* (Hemiptera: Belostomatidae) (Leidy) newly recorded from southeastern Alaska. *Proceedings of the Entomological Society of Washington*, 111: 280-281.
- Beutel, R. G. & F. Friedrich. 2008. Comparative study of larval head structures of Megaloptera (Hexapoda). *European Journal of Entomology*, 105: 917-938.
- Buhay, J. E. 2009. "COI-like" sequences are becoming problematic in molecular systematic and DNA barcoding studies. *Journal of Crustacean Biology*, 29: 96-110.
- Collier, K.J. 2008. Average score per metric: an alternative metric aggregation method for assessing wadeable stream health. *New Zealand Journal of Marine and Freshwater Research*, 42: 367-378.
- Dubois, A. 2008. Phylogenetic hypotheses, taxa and nomina in zoology. *Zootaxa*, 1950: 51-86.
- Foltz, S & S. Dodson. 2009. Aquatic Hemiptera community structure in stormwater retention ponds: a watershed land cover approach. *Hydrobiologia*, 621: 49-62.
- Hershler, R., & H. P. Liu. 2009. New species and records of *Pyrgulopsis* (Gastropoda: Hydrobiidae) from the Snake River basin, southeastern Oregon: further delineation of a highly imperiled fauna. *Zootaxa*, 2006: 1-22.
- Hussey, C., Y. De Jong & D. Remsen. 2008. Actual usage of biological nomenclature and its implications for data integrators; a national, regional and global perspective. *Zootaxa*, 1950: 5-8.
- Kraus, O. 2008. The Linnean foundations of zoological and botanical nomenclature *Zootaxa*, 1950: 9-20.
- Liu, X. Y., F. Hayashi, & D. Yang. 2009. Systematics of the *Protohermes parvus* species group (Megaloptera: Corydalidae), with notes on its phylogeny and biogeography. *Journal of Natural History*, 43: 355-372.
- McCreadie, J.W. & P. H. Adler. 2008. Spatial distribution of rare species in lotic habitats. *Insect Conservation and Diversity*, 1:127-134.
- Pyle, R. L. & E. Michel. 2008. ZooBank: Developing a nomenclatural tool for unifying 250 years of biological information. *Zootaxa*, 1950: 39-50.

Triapitsyn, S. V., R. B. Querino, & M. C. B. Feitosa. 2008. A New Species of *Anagrus* (Hymenoptera: Mymaridae) from Amazonas, Brazil. *Neotropical Entomology*, 37: 681-684.

Vogt, L. 2008. Learning from Linnaeus: towards developing the foundation for a general structure concept for morphology. *Zootaxa*, 1950: 123-152.

Odonata

Craig, C. N., B. A. Reece, & N. E. McIntyre. 2008. Nestedness in playa odonates as a function of area and surrounding land-use. *Wetlands*, 28: 995-1003.

Hassall, C., D. J. Thompson, & I. F. Harvey. 2008. Latitudinal variation in morphology in two sympatric damselfly species with contrasting range dynamics (Odonata: Coenagrionidae). *European Journal of Entomology*, 105: 939-944.

Keil, P. I. Simova, & B. A. Hawkins. 2008. Water-energy and the geographical species richness pattern of European and North African dragonflies (Odonata). *Insect Conservation and Diversity*, 1: 142-150.

Novelo-Gutierrez, R., & J. A. Gomez-Anaya. 2009. A comparative study of Odonata (Insecta) assemblages along an altitudinal gradient in the sierra de Coalcoman Mountains, Michoacan, Mexico. *Biodiversity and Conservation*, 18: 679-698.

Ephemeroptera

Baumgardner, D. E. 2009. *Tricorythodes minutus* Traver, a new synonym of *Tricorythodes explicatus* Eaton (Ephemeroptera: Leptohephidae). *Proceedings of the Entomological Society of Washington*, 111: 57-67.

Dias, L. G., F. F. Salles, & P. S. F. Ferreira. 2008. New species of *Tricorythopsis* Traver (Ephemeroptera: Leptohephidae) from northern Brazil. *Studies on Neotropical Fauna and Environment*, 43: 237-241.

Jacobus, L. M. & W. P. McCafferty. 2009. New Synonym of *Procloeon texanum* McCafferty and Provonsha (Ephemeroptera: Baetidae). *Proceedings of the Entomological Society of Washington*, 111: 282-283.

McCafferty, W. P. & M. D. Meyer. 2008. South Carolina mayflies (Ephemeroptera). *Transactions of the American Entomological Society*, 134: 283-335.

McCafferty, W. P., R. D. Waltz, & J. M. Webb. 2009. *Acentrella nadineae*, a new species of small minnow mayflies (Ephemeroptera: Baetidae). *Proceedings of the Entomological Society of Washington*, 111: 12-17.

Meyer, M. D. & W. P. McCafferty. 2008. Mayflies (Ephemeroptera) of the Far Western United States. Part 3: California. Transactions of the American Entomological Society, 134: 337-430.

O'Donnell, B. C. 2009. Early nymphal development in *Ephoron leukon* (Ephemeroptera: Polymitarcyidae) with particular emphasis on mouthparts and abdominal gills. Annals of the Entomological Society of America, 102: 128-136.

Plecoptera

Baumann, R.W. & J.J. Lee. 2009. Two interesting new species of *Isoperla* from northern California (Plecoptera: Perlodidae). Illiesia , 5(1): 1-10. <http://www2.pms-lj.si/illiesia/papers/Illiesia05-01.pdf>

Nelson, C.H. 2008. Hierarchical relationships of North American states and provinces: An area cladistic analysis based on the distribution of stoneflies (Insecta: Plecoptera). Illiesia, 4(18): 176-204. <http://www2.pms-lj.si/illiesia/Illiesia04-18.pdf>

Ribeiro, J. M. F., & J. A. Rafael. 2009. Redescription of the species of *Anacroneuria* Klapalek known from the Reserva Florestal Adolpho Ducke, Amazonas, Brazil with a neotype designation, and a key to adults males, Amazonas, Brazil. (Plecoptera, Perlidae). Zootaxa 2004: 1-15.

Trichoptera

Armitage, B. J. 2008. A new species in the *Rhyacophila lieftincki* Group (Trichoptera: Rhyacophilidae) from southwestern Virginia. Zootaxa, 1958: 65-68.

Blinn, D. W., D. E. Ruiter, & O. E. Flint. 2009. Notes on a collection of caddisflies (Trichoptera) from Carroll County, Iowa, USA. Proceedings of the Entomological Society of Washington, 111: 151-158.

Martins-Silva, M. J., D. W. Engel, F. M. da Rocha, & J. Araujo. 2008. Trichoptera immatures in Parana River Basin, Goias State, with New Records for Genera. Neotropical Entomology, 37: 735-738.

Santos, A. P. M., & J. L. Nessimian. 2009. A new species of microcaddisfly genus *Flintiella* Angrisano (Trichoptera: Hydroptilidae) from Amazonas State, Brazil. Zootaxa, 2004: 65-68.

Coleoptera

Chatzimanolis, S. & M. S. Caterino. 2008. Phylogeography and conservation genetics of Californian coastal terrestrial communities: a comparative study using three beetles. Insect Conservation and Diversity, 1: 222-232.

Kenner, R. D. 2008. Asymmetry of the sutural margins of elytra: implications for the generic classification of Haliplidae (Coleoptera). *Coleopterists Bulletin*, 62: 461-473.

Diptera

Borkent, A., C. J. Borkent, & B. J. Sinclair. 2008. The male genital tract of Chaoboridae (Diptera: Culicomorpha). *Canadian Entomologist*, 140: 621-629.

Byers, G. W., H. W. Robison, & B. Crump. 2008. Crane Flies of the Ouachita Highlands of Arkansas (Diptera: Tipulidae) II. *Journal of the Kansas Entomological Society*, 81: 373-376.

Curler, G. R., & G. W. Courtney. 2009. A revision of the world species of the genus *Neotelmatoscopus* Tonnoir (Diptera: Psychodidae). *Systematic Entomology*, 34: 63-92.

McLachlan, A. J., & R. J. Ladle. 2009. The evolutionary ecology of detritus feeding in the larvae of freshwater Diptera. *Biological Reviews*, 84: 133-141.

Nihei, S. S., & C. J. Barros De Carvalho. 2009. The Muscini flies of the world (Diptera, Muscidae): identification key and generic diagnoses. *Zootaxa*, 1976: 1-24.

Oyewo, E. A. & O. A. Sæther. 2008. Revision of *Polypedilum* (*Pentapedilum*) Kieffer and *Ainuyusurika* Sasa et Shirasaki (Diptera: Chironomidae). *Zootaxa*, 1953: 1-145.

Ronderos, M. M., C. G. Cazorla, G. R. Spinelli & D. S. Carrasco. 2008. Description of immature stages and adult diagnosis of *Stilobezzia coquilletti* Kieffer 1917 (Diptera: Ceratopogonidae). *Zootaxa*, 1958: 31-40.

Ronderos, M. M., F. Diaz, & P. Sarmiento. 2008. A new method using acid to clean and a technique for preparation of eggs of biting midges (Diptera: Ceratopogonidae) for the Scanning Electron Microscope. *Transactions of the American Entomological Society*, 134: 471-476.

Roque, F. O., & S. Trivinho-Strixino. 2008. Four new species of *Endotribelos* Grodhaus, a common fallen fruit-dwelling chironomid genus in Brazilian streams (Diptera: Chironomidae: Chironominae). *Studies on Neotropical Fauna and Environment*, 43: 191-207.

Rossi, G. C., M. Laurito & W. R. Almirin. 2008. Morphological description of the pupa and redescription of the adults and larva of *Culex* (*Culex*) *apicinus* Philippi (Diptera: Culicidae). *Zootaxa*, 1941: 31-42.

Stur, E. & T. Ekrem. 2008. Description of the Alpine *Micropsectra oberoensis* sp. n. with taxonomic comments on the *attenuata* group (Diptera: Chironomidae). *Entomologica Fennica*, 19: 142-150.

Tarkowska-Kukuryk, M & R. Kornijow. 2008. Influence of spatial distribution of submerged macrophytes on Chironomidae assemblages in shallow lakes. *Polish Journal of Ecology*, 56: 569-579.

Wiedenbrug, S, & S. Trivinho-Strixino. 2009. *Ubatubaneura*, a new genus of the *Corynoneura* group (Diptera: Chironomidae: Orthoclaadiinae) from the Brazilian Atlantic Forest. *Zootaxa*, 1993: 41-52.

THANK YOU FOR YOUR MEMBERSHIP!

Board of Directors:

Joseph Slusark, President 530.898.4792

D. Christopher Rogers, Vice President 530.756.4481

Raphael Mazor, Treasurer 714.755.3235

Kim Kratz, Secretary 503.231.2155

Scott Johnson, Member at Large 805.643.5261 x11

Editorial Board:

D. Christopher Rogers, Newsletter Editor 530.756.4481

Brady Richards, 530.898.4792

Jon Lee, 707.441.9347

SAFIT

SOUTHWEST ASSOCIATION OF FRESHWATER INVERTEBRATE TAXONOMISTS

Greetings!

Summer is upon us and SAFIT has been busy! We have had some issues with the website. Evil entities got into the website and installed “malware”. A big thanks to the Website Committee for getting rid the “malware” and for working on moving us to a new server.

The STE committee is expanding the STE in 2009 to cover the remainder of the SAFIT geographical region, namely, Utah. The updated STE will incorporate the accumulated STE changes, which in the interim are posted on the SAFIT Website.

The SAFIT officers will be contacting water quality oriented agencies in Nevada, Arizona and Utah to establish the SAFIT STE as the recognized standard for their programs as well.

Have a job opening that you want to announce, or are looking for a job? Let SAFIT know in the Newsletter! Looking for specimens of a certain species or a literature reference? Need material for research or comparative purposes? Let your colleagues know in the SAFIT Newsletter! Want a workshop on a particular group of organisms? Have references to sell trade or share? Looking for a collecting partner? Put it here in the SAFIT Newsletter! All appropriate requests, queries, non-commercial advertisements and announcements will be considered, and are free to the SAFIT membership.

Thanks!

The SAFIT Board

ANNOUNCEMENTS

Workshop on Crustacean Bioturbation <http://www.ub.edu/paleoneomed/workshop/>

SCCWRP will be hosting a seminar Wednesday, 16 September 2009 on Barcoding with associated discussion workshops being developed. Please see the SCCWRP website <http://www.sccwrp.org/> for details.

CABW will hold its 16th annual meeting 28 and 29 October 2009. This is a major change, as in previous years it has been held in November. As a result, the SAFIT meeting will be held 30 October 2009 (see below). This year the CABW meeting will have more workshops for those who are learning about the various aspects of bioassessment and using biomonitoring data. As in

previous years CABW will be held at the UC Davis Activities and Recreation Center (ARC) from 8 – 4 each of the two days. There is never any fee, but registration is required: Regional and State Water Board Staff should register at: <http://waternet/training/>, All other participants should register at: <http://www.waterboards.ca.gov/academy/> For additional details, please contact James Harrington at jharring@OSPR.DFG.CA.GOV

SAFIT MEETINGS

Annual Business Meeting announcement: The regular annual business meeting will be held 30 October 2009. The location of the meeting has not yet been determined, but will be emailed out to all concerned as soon as we have the details.

Workshops in the Works:

Proposed workshop on immature Chironomidae, Davis, 9-11 September 2009

This will be led by Peter Cranston, an entomology professor at UC Davis, and recognized authority on the Chironomidae.

Day 1. Wednesday 9 September 8.00 am to 4.30 pm. Briggs 122.

8.00-8.30. Introductions and exploration of individual backgrounds and needs from course.

8.30-9.45. Chironomid biology lecture– life-history, significance ecologically, nuisance issues, some autecology of significant taxa, fly-fishing, biogeography.

9.45 – 10.10. Coffee break.

10.10 – 11.50. Introduction to keying (and allied data) in Lucid interactive key, using a variety of existing and on-line guides. Use of glossary features (illustration and text).

11.50-1.15. Lunch break allowing time off campus.

1.15 – 4.30. Slide-making. Introduction to larval subfamily Lucid key, and exploring character images, diagnostic notes, and taxa. Subkey linkages to lower level (within subfamily).

Attendees will be provided with an individual version of the Lucid larval key updated for the workshop.

Day 2. Thursday 10 September 8.00 am to 4.30 pm. Briggs 122.

8.00. Continued slides tutoring (for novices). Lucid guide to smaller subfamilies, exploring the characters used via text and images.

Tanypodinae identification and character subsets and the 'start chart feature'

11.50-1.15. Lunch break allowing time off campus.

1.15. Chironominae and Orthocladiinae Lucid keys. Opportunity to examine Davis-made voucher slides. Common discussion of 'weird' larvae brought by attendees.

Brief introduction to pupal identification.

Day 3. Friday 11 September 8.00 am to 2.30 pm. Briggs 122. Voluntary participation.

8.00-11.50. Introduction to Chironomidae pupal identification via paper and Lucid keys. This key is very incomplete but will be used for guidance in morphology via an illustrated glossary.

Slide preparation of pupal specimens.

11.50-1.15. Lunch break allowing time off campus.

1.15- 2.30. Post lunch wrap-up with question session, mystery slides.

OTHER NEWS

The North American Plecoptera Symposium IX took place at the Sagehen Creek Field Station, University Of California, Truckee, CA 22-25 June 2009. It is a beautiful venue for a conference and Sagehen Creek and its numerous springs allow for abundant collecting opportunities. The following presentations were given:

Moderators: W. Shepard and A. Sheldon

The drumming signals of *Hesperoperla hoguei* and *Hesperoperla pacifica* (Plecoptera: Perlidae) from northern California. John Sandberg.

New records of winter stoneflies (Plecoptera: Capniidae) for Mississippi, and development of an annual winter stonefly count. Bill P. Stark (presenter) & Matthew B. Hicks.

Current range and regional genetic diversity of *Acroneuria frisoni* Stark & Brown, 1991: A prelude to reintroduction of the species to eastern Illinois. Ember R. Chabot (presenter), R. Edward DeWalt & Rosanna Giordano

Life history of *Cosumnoperla hypocrena* (Plecoptera: Perlodidae): Adaptation to a California intermittent stream. Richard L. Bottorff.

A review of undescribed taxa of eastern Nearctic *Isoperla* (Plecoptera: Perlodidae). S. W. Szczytko & B. C. Kondratieff (presenter)

Phylogeography of Great Basin sky island populations of *Doroneuria baumanni* (Plecoptera: Perlidae). Alicia S. Schultheis, Jackie Y. Booth, Lisa R. Perlmutter & Andrew L. Sheldon (presenter).

The influence of introduced trout on the Perlidae of the High Sierra: Contrasting fishless and trout-stock paired headwater streams in Yosemite National Park. David B. Herbst (presenter), Erik L. Silldorff & Scott D. Cooper.

Notes on the *Diura* population of Mount Washington, New Hampshire, USA. Charles H. Nelson.

The *Alloperla leonarda* group of eastern North America (Plecoptera: Chloroperlidae). Michele R. Willett & Bill P. Stark (presenter).

Stoneflies in the canopy--- Que pasa? William D. Shepard (presenter) & Richard W. Baumann.

Preliminary nymph descriptions of four *Isoperla* species (Plecoptera: Perlodidae) from California and Oregon with an introduction to mouthpart characters used for separation of western species. John Sandberg

A picture is worth a thousand words. Continuing studies of the distribution of Pennsylvania stoneflies. Jane Earle.

Testing some of Ross & Ricker's *Allocapnia* hypotheses of Wisconsinan post-glacial dispersion using population genetic variation in *Allocapnia granulata* (Claassen, 1924). R. Edward DeWalt (presenter) & Rosanna Giordano.

Sagehen Creek Field Station: Environments and research programs. Jeff Brown.

Preliminary report of the drumming signals for 19 stoneflies (Plecoptera) from northern California John Sandberg.

Two new genera of Brachypterainae (Plecoptera: Taeniopterygidae) from North America. Richard W. Baumann (presenter) & Boris C. Kondratieff.

Tropical stoneflies: Low diversity or different rules? Andrew L. Sheldon.

Correction of a misidentification of *Capnia umpqua*, including a description of a new species. C. Riley Nelson (presenter) & Richard W. Baumann.

Acroneuria filicis Frison: an assessment of geographic variability using scanning electron microscopy, and the plausibility of new species descriptions. Scott A. Grubbs & R. Edward DeWalt (presenter).

Poster Session:

New descriptions of North American *Taenionema* nymphs (Plecoptera: Taeniopterygidae). Kenneth W. Stewart.

A scanning electron microscopy study of Mississippi Leuctridae with a description of a possible new species in the *Leuctra ferruginea* complex. Audrey B. Harrison & Bill P. Stark.

The North American Plecoptera Symposium X will take place in the Great Lakes Region, 2012. SAFIT members collected the following stoneflies and caddisflies during the symposium and on the dispersal flight:

2009 NAPS Sagehen Creek and vicinity field collection results:

Plecoptera	<i>Haploperla chilnualna</i> (c)
Capniidae	<i>Plumiperla</i> sp. (1 female) (c)
<i>Eucapnopsis brevicauda</i> (a)	<i>Sweltsa</i> sp. (d)
Leuctridae	<i>Sweltsa borealis</i> (complex?) (a)
<i>Paraleuctra vershina</i> (a)	<i>S. pacifica</i> (a)
Nemouridae	<i>S. townesi</i> (a)
<i>Malenka cornuta</i> complex (b)	<i>Triznaka pintada</i> (c)
<i>M. marionae</i> (a)	Peltoperlidae
<i>Podmosta delicatula</i> (a)	<i>Sierraperla cora</i> (b)
<i>Soyedina nevadensis</i> (a)	<i>Soliperla sierra</i> (b)
<i>Zapada oregonensis</i> (a)	<i>Yoraperla nigrisoma</i> (a), (b)
Chloroperlidae	Perlodidae
<i>Alloperla</i> sp. (a)	<i>Isoperla mormona</i> (c)
<i>Alloperla chandleri</i> (much variation in epiproct – some <i>A. fraterna</i> ?) (a), (b)	<i>Isoperla sobria</i> (a)
	<i>Rickera sorpta</i> (a)
Trichoptera	
Rhyacophilidae	<i>R. norcuta</i> (b)
<i>Rhyacophila ecosia</i> (b)	<i>R. oreta</i> (a), (b)
<i>R. nevadensis</i> (a)	<i>R. velora</i> (b)

R. verrula (b)***Glossosomatidae****Anagapetus aisha* (a), (b)***Philopotamidae****Dolophilodes novusamericanus* (b)*Wormaldia* sp. (1 female) (a)***Apataniidae***

(1 female) (a)

Brachycentridae*Micrasema bacro* (a)***Goeridae****Goeracea oregona* (a), (d)***Lepidostomatidae****Lepidostoma cascadenense* (a)***Limnephilidae***

(1 female) (a)

Odontoceridae (1 female) (b)*Parthina linea* (d)***Uenoidae****Neophylax occidentis* (a)

(a) - Sagehen Creek and springs

(b) - Big Springs @ Hwy 49

(c) - creek south of Sierraville, Hwy 89

(d) - Boca Spring

FIELD & LAB***By Jon Lee**

(* New features in each Newsletter issue exploring an aspect of aquatic macroinvertebrates beyond sample processing would be beneficial to members. Please feel free to contact the editor if you would like to contribute or have thoughts on a salient topic. This first feature will discuss a couple of techniques for rearing immature aquatic insects to adults).

The impetus for this topic was the successful rearing of immature *Salmoperla sylvanica* (Plecoptera: Perlodidae) in spring 2009 using two different methods. These critters live in cold (8°C when collected in April) mountain streams and are considered difficult to artificially rear to adult.

Creating an artificial stream using an aquarium:

It is relatively simple to create an artificial stream using a glass aquarium. Materials needed include the aquarium (I use an old 50 gallon tank), an under-gravel filter, gravel, a power head, and some Plexiglas. The under-gravel filter is a hard plastic platform fitting the bottom of the aquarium. It is about 1.5 cm tall and has many perforations allowing water to circulate through it. In a corner is an opening to fit the power head. The power head is placed in the opening with

its footing several cm high. A few cm of aquarium gravel covers the filter and gives a home to aerobic bacteria acting as a living water cleansing system. The Plexiglas sheet (or any suitable material) should be taller than the water level and a few cm shorter than the aquarium length to act as a baffle. The baffle is placed lengthwise in the center of the tank allowing for a gap at either end. The jet of water from the power head is directed down the length of one side of the aquarium creating circulation around the baffle.

Various rocks, pieces of wood, etc. can be placed on the gravel for insect habitat. Creek stones can be used to introduce diatoms and alder or other leaves can be used as a nutrient source. Aquatic moss can also do well in this setup. Twigs and rocks (or equivalent) with surface exposed above water level, should be placed in the gravel to allow a haul out for adult insects.

Immatures should be kept cool and moist during transport from creek to rearing tank. They can be kept in Styrofoam cups (Styrofoam allows them to sink there claws in and cling to the sides) partially filled with creek water and placed in a cooler with ice. A piece of foam rubber fitted to the bottom of a jar, kept wet, and placed in a cooler also works well.

Water temperature is an issue. Placing the artificial stream in a cold part of the house should be adequate for those critters that emerge in the spring. On the cool coast, cutthroat trout did well through the summer without a cooling device (which can be expensive). While rearing *Salmonella*, the water reached 16°C on a warm spring day. Fearing the worst, a search was made for the nymphs. A nymph was found alive and well under a stone directly in front of the jet from the power head which apparently supplied enough oxygen to maintain the nymph, at least temporarily, at an elevated temperature. Water filled, frozen, ½ gallon juice containers were placed in the tank used to decrease the water temperature.

This method has worked well for rearing many different species of stoneflies and various mayflies and caddisflies introduced as food items. It is also a good way to observe underwater behavior. It is easy to go overboard though, so be prepared to have critters flying around your lab or home!

EMPLOYMENT OPPORTUNITIES

Taxonomist Positions

EcoAnalysts, Inc. has **job openings for a macroinvertebrate taxonomist, consulting scientist, and a periphyton taxonomist, as well as lab tech positions.** The lab tech positions and the macroinvertebrate taxonomist positions are in the Moscow, Idaho office and the periphyton taxonomist position would be in either Moscow, Idaho or Joplin, MO. The consulting scientist position does not have a locality yet. The full details are available at <http://ecoanalysts.com/>.

LATEST LITERATURE

If you know of any literature or if you yourself have published any papers of interest to the SAFIT membership, please send copies or the citations to Brady Richards (arichards@csuchico.edu) for inclusion in the next issue of the SAFIT Newsletter. Thanks!!

Crustacea

- Beladjal, L., and J. Mertens. 2009. Diaspore dispersal of Anostraca by flying insects. *Journal of Crustacean Biology* 29 (2):266-268.
- Cantu, V., J.N. Fries, and T.A. Ryan. 2009. An apparatus for separating live amphipods from debris. *North American Journal of Aquaculture* 71 (1):6-9.
- Fišer, C., B. Sket, M. Turjak, and P. Trontelj. 2009. Public online databases as a tool of collaborative taxonomy: a case study on subterranean amphipods. *Zootaxa* (2095):47-56.
- Guiasu, R.C. 2009. Conservation, status, and diversity of the crayfishes of the genus *Cambarus* Erichson, 1846 (Decapoda, Cambaridae). *Crustaceana* 82 (6):721-742.
- He, Shun-Lian, Jie Gao, and Zhao-Liang Guo. 2009. *Macrobrachium pentazona*, a new freshwater palaemonid prawn (Decapoda: Caridea: Palaemonidae) from Guangdong Province, China. *Zootaxa* (2140):38-44.
- Larsen, Kim, Catarina de L. Araújo-Silva, and Petrônio Alves Coelho. 2009. Tanaidacea from Brazil. I. The family Tanaellidae Larsen & Wilson, 2002. *Zootaxa* (2141):1-19.
- Zimmer, A., P.B. Araujo, and G. Bond-Buckup. 2009. Diversity and arrangement of the cuticular structures of *Hyaella* (Crustacea: Amphipoda: Dogielinotidae) and their use in taxonomy. *Zoologia* 26 (1):127-142.

Mollusca

- Chong, J.P., J.B. Box, D.A. Nez, and K.E. Mock. 2009. Isolation and characterization of microsatellite loci in the western pearlshell mussel, *Margaritifera falcata* (Gould). *Molecular Ecology Resources* 9 (3):995-999.
- Liu, H.P., and R. Hershler. 2009. Genetic diversity and population structure of the threatened Bliss Rapids snail (*Taylorconcha serpenticola*). *Freshwater Biology* 54 (6):1285-1299.
- Tiemann, J.S., K.S. Cummings, and C.A. Mayer. 2009. Timed search technique used to evaluate freshwater mussel (Bivalvia: Unionidae) species richness in headwater streams: is a single one-hour visit enough? *Journal of Freshwater Ecology* 24 (1):85-92.

Turner, A.M., and S.L. Montgomery. 2009. Hydroperiod, predators and the distribution of physid snails across the freshwater habitat gradient. *Freshwater Biology* 54 (6):1189-1201.

Annelida

Christoffersen, M.L. 2009. Species diversity and distributions of microdrile earthworms (Annelida, Clitellata, Enchytraeidae) from South America. *Zootaxa* (2065):51-68.

Edwards, F.K., R.B. Lauridsen, L. Armand, H.M. Vincent, and J.I. Jones. 2009. The relationship between length, mass and preservation time for three species of freshwater leeches (Hirudinea). *Fundamental and Applied Limnology* 173 (4):321-327.

Coleoptera

Bernhard, D., I. Ribera, A. Komarek, and R.G. Beutel. 2009. Phylogenetic analysis of Hydrophiloidea (Coleoptera: Polyphaga) based on molecular data and morphological characters of adults and immature stages. *Insect Systematics & Evolution* 40 (1):3-41.

Braga, R.B., and N. Ferreira. 2009. Three new species of *Bidessodes* Regimbart (Insecta, Coleoptera, Dytiscidae) from the Amazon river floodplain. *Zootaxa* (2034):43-48.

Byttebier, Barbara, and Patricia L.M. Torres. 2009. Description of the preimaginal stages of *Enochrus* (*Hugoscottia*) *variegatus* (Steinheil, 1869) and *E. (Methydrus) vulgaris* (Steinheil, 1869) (Coleoptera: Hydrophilidae), with emphasis on larval morphometry and chaetotaxy. *Zootaxa* (2139):1-22

Clarkson, Bruno, and Nelson Ferreira, Jr. 2009. Three new species of *Hemiosus* Sharp (Coleoptera: Hydrophilidae) and new state records of *Hemiosus fittkaui* Oliva and *H. moreirai* d'Orchymont from Brazil. *Zootaxa* (2139):61-68.

Fikacek, M., F. Hebauer, and M. Hansen. 2009. Taxonomic revision of New World species of the genus *Oosternum* Sharp (Coleoptera: Hydrophilidae: Sphaeridiinae) I. Definition of species groups and revision of the *Oosternum aequinoctiale* group. *Zootaxa* (2054):1-37.

Hendrich, L., and C.H.S. Watts. 2009. Taxonomic revision of the Australian predaceous water beetle genus *Carabhydrus* Watts, 1978 (Col. Dytiscidae, Hydroporinae, Hydroporini). *Zootaxa* (2048):1-30.

Majka, C.G. 2008. The aquatic Coleoptera of Prince Edward Island, Canada: new records and faunal composition. *Zookeys* (2 (Special Issue)):239-260.

Toledo, M. 2009. Revision in part of the genus *Nebrioporus* Regimbart, 1906, with emphasis on the *N-laeviventris*-group (Coleoptera: Dytiscidae). *Zootaxa* (2040):3-111.

Diptera

- Bouchard, R.W., and L.C. Ferrington. 2009. Winter growth, development, and emergence of *Diamesa mendotae* (Diptera: Chironomidae) in Minnesota streams. *Environmental Entomology* 38 (1):250-259.
- Brammer, C.A., J.R. Harkrider, and J.F. Macdonald. 2009. Differentiation of larvae and pupae of aquatic genera of Nearctic Hemerodromiinae (Diptera: Empididae). *Zootaxa* (2069):59-68.
- de Pinho, L.C., H.F. Mendes, and T. Andersen. 2009. A review of *Skutzia* Reiss, 1985, with the description of three new species (Diptera: Chironomidae: Chironominae). *Journal of the North American Benthological Society* 28 (1):196-206.
- Ekrem, T., and E. Stur. 2009. A review of the genus *Zavrelia* (Diptera: Chironomidae). *European Journal of Entomology* 106 (1):119-144.
- Liu, Q.F., and D. Yang. 2009. Two new species of the genus *Brithura* Edwards from China, with a key to world species (Diptera, Tipulidae). *Zootaxa* (1991):51-56.
- Matsumoto, Y., T. Yanase, T. Tsuda, and H. Noda. 2009. Species-specific mitochondrial gene rearrangements in biting midges and vector species identification. *Medical and Veterinary Entomology* 23 (1):47-55.
- Punti, T., M. Rieradevall, and N. Prat. 2009. Environmental factors, spatial variation, and specific requirements of Chironomidae in Mediterranean reference streams. *Journal of the North American Benthological Society* 28 (1):247-265.
- Rafael, J.A., and J.M. Cumming. 2009. Revision of the genus *Macrostomus* Wiedemann (Diptera: Empididae: Empidinae). I. The *ferrugineus* species-group. *Zootaxa* (2064):39-56.
- Tomberlin, J.K., P.H. Adler, and H.M. Myers. 2009. Development of the black soldier fly (Diptera: Stratiomyidae) in relation to temperature. *Environmental Entomology* 38 (3):930-934.
- Tothova, A., G.R. Spinelli, and P.I. Marino. 2009. A new Nearctic species of *Atrichopogon* (*Meleohelea*) and a redescription of *Atrichopogon* (*M.*) *chilensis* Ingram & Macfie (Diptera: Ceratopogonidae). *Zootaxa* (2023):47-54.
- Vinogradova, E.M., H.W. Riss, and M. Spies. 2009. New species of *Tanytarsus* van der Wulp, 1874 (Diptera: Chironomidae) from Central America. *Aquatic Insects* 31 (1):11-17.

Woodley, N.E. 2009. *Microchrysa flaviventris* (Wiedemann), a new immigrant soldier fly in the United States (Diptera: Stratiomyidae). *Proceedings of the Entomological Society of Washington* 111 (2):527-529.

Woodley, N.E. 2009. A review of the genus *Ditylometopa* Kertész (Diptera: Stratiomyidae). *Zootaxa* (2032):39-47.

Wuelker, W., J. Martin, II Kiknadze, J.E. Sublette, and S. Michiels. 2009. *Chironomus blaylocki* sp n. and *C. bifurcatus* sp n., North American species near the base of the *decorus*-group (Diptera: Chironomidae). *Zootaxa* (2023):28-46.

Ephemeroptera

Dominguez, Eduardo, Carlos Molineri, and Rodolfo Mariano. 2009. Revision of the South American species of *Hagenulopsis* Ulmer and *Askola* Peters (Ephemeroptera: Leptophlebiidae) with description of six new species. *Zootaxa* (2142):29-44.

Ogden, T.H., J.T. Osborne, L.M. Jacobus, and M.F. Whiting. 2009. Combined molecular and morphological phylogeny of Ephemerellinae (Ephemerellidae: Ephemeroptera), with remarks about classification. *Zootaxa* (1991):28-42.

Odonata

Cordoba-Aguilar, A., G. Raihani, M.A. Serrano-Meneses, and J. Contreras-Garduno. 2009. The lek mating system of *Hetaerina* damselflies (Insecta: Calopterygidae). *Behaviour* 146:189-207.

Machado, A.B.M. 2009. *Denticulobasis* and *Tuberculobasis*, new genera close to *Leptobasis*, with description of ten new species (Odonata: Coenagrionidae). *Zootaxa* (2108):1-36.

Reece, B.A., and N.E. McIntyre. 2009. Odonata of playas in the southern High Plains, Texas. *Southwestern Naturalis* 54 (1):96-99.

Remsburg, A.J., and M.G. Turner. 2009. Aquatic and terrestrial drivers of dragonfly (Odonata) assemblages within and among north-temperate lakes. *Journal of the North American Benthological Society* 28 (1):44-56.

Stevens, L.E., and R.A. Bailowitz. 2009. Odonata biogeography in the Grand Canyon Ecoregion, Southwestern USA. *Annals of the Entomological Society of America* 102 (2):261-274.

Plecoptera

- Elliot, J.M. 2009. Inter- and intra-specific differences in the number of larval instars in British populations of 24 species of stoneflies (Plecoptera). *Freshwater Biology* 54 (6):1271-1284.
- Kondratieff, Boris C., and Richard W. Baumann. 2009. A contribution to the knowledge of *Sweltsa exquisita* (Frison) and *S. occidentis* (Frison) and description of a new species of *Sweltsa* from the northern Rocky Mountains, U.S.A. (Plecoptera: Chloroperlidae). *Illiesia* 5 (3):20-29.
- Sheldon, A.L., and M.L. Warren. 2009. Filters and templates: stonefly (Plecoptera) richness in Ouachita Mountains streams, USA. *Freshwater Biology* 54 (943-956).
- Stark, Bill P., and Andrew L. Sheldon. 2009. Records of Neoperlini (Plecoptera: Perlidae) from Brunei Darussalam and Sarawak, with descriptions of new *Phanoperla* Banks and *Neoperla* Needham species. *Illiesia* 5 (2):11-19.
- Stewart, K.W. and N.H. Anderson. 2009. The life history and nymphal generic character development of *Sweltsa adamantea* Surdick (Plecoptera; Chloroperlidae) in an Oregon summer-dry headwater stream. *Transactions of the American Entomological Society* 135 (1+2): 161-173.

Trichoptera

- Cartwright, David I. 2009. *Austrotinodes* Schmid, a South and Central American caddisfly genus, newly recorded in Australia, with the description of new species (Trichoptera: Ecnomidae). *Zootaxa* (2142):1-19.
- Davies, J.N., and A.J. Boulton. 2009. Great house, poor food: effects of exotic leaf litter on shredder densities and caddisfly growth in 6 subtropical Australian streams. *Journal of the North American Benthological Society* 28 (2):491-503.

General

- Hall, L.W., W.D. Killen, and R. Alden. 2009. Long-term historical analysis of benthic communities and physical habitat in an agricultural stream in California's San Joaquin River watershed. *Journal of Environmental Science and Health Part A-Toxic/Hazardous Substances & Environmental Engineering* 44 (6):543-556.
- Melo, A.S. 2009. Explaining dissimilarities in macroinvertebrate assemblages among stream sites using environmental variables. *Zoologia* 26 (1):79-84.

- Nemésio, André. 2009. Nomenclatural availability of nomina of new species should always require the deposition of preserved specimens in collections: a rebuttal to Donegan (2008). *Zootaxa* (2045):1-14.
- Nowak, C., C. Vogt, M. Pfenninger, K. Schwenk, J. Oehlmann, B. Streit, and M. Oetken. 2009. Rapid genetic erosion in pollutant-exposed experimental chironomid populations. *Environmental Pollution* 157 (3):881-886.
- Pearson, R.G., and L. Boyero. 2009. Gradients in regional diversity of freshwater taxa. *Journal of the North American Benthological Society* 28 (2):504-514.
- Progar, R., and A.R. Moldenke. 2009. Aquatic insect emergence from headwater streams flowing through regeneration and mature forests in Western Oregon. *Journal of Freshwater Ecology* 24 (1):53-66.
- Purcell, A.H., D.W. Bressler, M.J. Paul, M.T. Barbour, E.T. Rankin, J.L. Carter, and V.H. Resh. 2009. Assessment tools for urban catchments: developing biological indicators based on benthic macroinvertebrates. *Journal of the American Water Resources Association* 45 (2):306-319.
- Roberts, L., G. Boardman, and R. Voshell. 2009. Benthic macroinvertebrate susceptibility to trout farm effluents. *Water Environmental Research* 81 (2):150-159.

THANK YOU FOR YOUR MEMBERSHIP!

Board of Directors:

Joseph Slusark, President 530.898.4792
D. Christopher Rogers, Vice President 530.383.4798
Raphael Mazor, Treasurer 714.755.3235
Kim Kratz, Secretary 503.231.2155
Scott Johnson, Member at Large 805.643.5261 x11

Editorial Board:

D. Christopher Rogers, Newsletter Editor 530.383.4798
Jon Lee, 707.441.9347
Brady Richards, 530.898.4792

The SAFIT Newsletter

SOUTHWEST ASSOCIATION OF FRESHWATER INVERTEBRATE TAXONOMISTS

Happy 2010!

SAFIT has been busy the last several months. The first full-fledged SAFIT sponsored workshop (Chironomidae Taxonomy) took place in September. The [SAFIT website](#) has expanded and now includes the list of 2003 CAMLnet Tolerance Values and Functional Feeding Group designations. The STE has undergone its first full revision, expanding east and now including Utah. This 2010 revision should be available soon.

Have a job opening that you want to announce, or are looking for a job? Let SAFIT know in the Newsletter! Looking for specimens of a certain species or a literature reference? Need material for research or comparative purposes? Let your colleagues know in the SAFIT Newsletter! Want a workshop on a particular group of organisms? Have references to sell trade or share? Looking for a collecting partner? Put it here in the SAFIT Newsletter! All appropriate requests, queries, non-commercial advertisements and announcements will be considered, and are free to the SAFIT membership.

Thanks,
Jon Lee, Editor

ANNOUNCEMENTS

D. Christopher Rogers, founder and editor of The SAFIT Newsletter has decided to step down from his editorial duties but will remain as a valued member of the editorial board. Christopher is primarily responsible for The Newsletter format and has been the driving force in getting The Newsletter published. Although his skills as editor will be missed, he has offered his assistance in moving The Newsletter forward. Jon Lee will replace Christopher as The Newsletter editor beginning with the current issue. Jon will attempt to maintain The Newsletter's high quality standards with the help of Christopher and Brady Richards. Any comments or suggestions are welcome.

Cabinets, Drawers, & Boxes

The Essig Museum of Entomology at UC Berkeley is selling California Academy System-style cabinets for \$20, as well as insect drawers for \$5 and Schmitt boxes for \$5. Cash and carry. Please contact Cheryl Barr, cbarr@nature.berkeley.edu, 510-643-0804, in advance. There is an excellent selection of cabinets, which can be used to store many items besides insects.

SAFIT MEETINGS

Chironomidae Workshop Summary:

On 9-11 September 2009 SAFIT held a chironomid taxonomy workshop at UC Davis. Twenty six people attended the workshop from many agencies, firms and organizations including: California Department of Fish and Game, California Department of Water Resources, Sierra Nevada Aquatic Research Laboratory, U. S. Forest Service, ECORP, Bioassessment Services, EcoAnalysts, The Nature Conservancy, Idaho Department of Fish and Game, Pyramid Lake Paiute Tribe, UC Davis, and several private consultants from around the western USA.

The workshop provided comprehensive instruction in the taxonomy of larval and pupal Chironomidae. The course instructor was Dr. Peter Cranston, Professor of Entomology at UC Davis. Dr. Cranston is one of the worlds leading experts in the systematics and biology of the Chironomidae and is a pioneer in the use of computer based taxonomic software. Attendees received a complete introduction to the biology, taxonomy, and biogeography of the Chironomidae and training in the proper preparation of specimens for study. In addition attendees were trained in the use of Lucid software based taxonomic tools and received a copy of a Lucid interactive key to the immature Chironomidae prepared by Dr. Cranston for the workshop.

I have a limited number of copies of the Lucid key and SAFIT members may obtain a copy by contacting me at jslusark@csuchico.edu or you can contact Dr. Peter Cranston at pcranston@ucdavis.edu for a copy.

Joe Slusark

2010 STE Revision Update:

For those of you who didn't make it to the SAFIT business meeting this year, I wanted to provide an update on the status of the STE revision. The decision to revise the STE was made during the 2008 SAFIT meeting, but in a way, the revision has been underway since the adoption of the present version in November 2006. Some of the things that have been added for this new revision are authorities for nearly all of the 4000+ taxonomic names, including all higher level taxa (genus and up); adding taxa and distribution records for Utah and beginning the work to add western New Mexico and Colorado, thus rounding out the SAFIT regional coverage. While taxonomic authorities don't impact us in bioassessment on a day to day basis, in effect, including authorities ties each name to a piece of literature. This is one of the driving concerns behind the STE Rules document – that we have every name, every distribution record, habitat information, etc. backed up by the peer-reviewed, published literature.

The timeline for this 2010 version of the STE has hit several snags this year. Namely, family and some minor health issues have consumed a large portion of my time since this summer. At the October meeting, I called for a deadline on submissions of suggested changes by sometime in November but I wanted to communicate this to the entire SAFIT membership. Since this article is the first time I have spoken to the entire membership, I feel the need to move that deadline.

If anyone has found errors or omissions in the 2006 version of the STE or if you have new names, distribution records, etc. to report, please submit them to Christopher or me by **January 15th 2010** using the suggested change form we provided in the Rules document. We have had very few SAFIT members contact us over the past three years with suggested changes, but I'd like to thank those who have. In particular, thanks to those who have taken the time to fill out the change forms.

While Christopher and I have done the main work on the STE and related documents, the STE Committee will review all proposed changes from the previous version. After this, the draft STE will be distributed by email or on the SAFIT website so that the membership can vote on it. I will provide a list of the changes at that time to make it easier to see how the 2010 version will differ from the present version. I'm hoping to have that vote by late January or early February. Once the membership has approved of the new version, we can make it retroactive to January 1, 2010.

Finally, as I've worked on the STE over the past four years, it has become painfully obvious that the current format – basically a very large Excel spreadsheet (the master source file) which is then pared down to a series of smaller tables in Word then PDF formats – will not suffice for the needs of SAFIT in the future. For the next revision, the STE will have to be converted into database format. I believe that will be the only way to contain all the data, the only way we can maintain the data and make the data accessible by all. I'll be talking more about this in the future, but for now, I'll be focused on finishing work on the 2010 version.

Thanks,
Brady Richards

Submit suggested changes to
Austin Brady Richards
arichards@csuchico.edu

or

D. Christopher Rogers
crogers@ecoanalysts.com or branchiopod@gmail.com

FIELD & LAB

A feature in each Newsletter issue exploring an aspect of aquatic macroinvertebrates beyond sample processing that may be beneficial to members. Please feel free to contact the editor if you would like to contribute or have thoughts on a salient topic.

The impetus for this topic was the successful rearing of immature *Salmoperla sylvanica* (Plecoptera: Perlodidae) in spring 2009 using two different methods. Jon Lee presented the first method in Volume 2, Issue 2. John Sandberg presents the second method here:

Aquatic Insect Collection and Rearing Techniques

By John Sandberg

Collecting aquatic insects in the field is a rewarding and beneficial activity in which many taxonomists partake. Stonefly adult and nymph collecting utilize two general methods: dip net substrate sampling for aquatic individuals and beat sheet vegetation sampling for adults. A second adult collecting method is rock turning at stream margins. Brady Richards or I can take you to a productive early spring location on top of Table Mountain, Butte County, where you'll soon be laughing at the ease of adult stonefly collecting. Before I forget, you will also need an insect collection device called an aspirator to increase your effectiveness whether beat sheeting or turning rocks.

To absolutely determine the identity, whether generic or specific, many taxonomists utilize rearing techniques (immature to adult) specific to the insect order of interest. This is because species keys exist mainly for adults. For most stoneflies, the adult male can be keyed to species the easiest (barring aedeagus evertion, which is necessary for all *Isoperla* spp. and some other genera). To rear stonefly nymphs to the adult stage, you must collect nymphs as close to the natural emergence as possible. When collecting mature nymphs with large and often dark wing pads, you must not harm them, so soft touch forceps are necessary.

To rear from nymph to adult, you will need to collect stream water to refill rearing chambers with fresh water at regular intervals. Any size water container will work. I suggest 5-10 gallons for 10-20 nymphs. At the stream, nymphs are picked from substrate and debris and a few are placed into Styrofoam cups (rearing chambers) containing stream water, and then covered with tight fitting plastic lids. Keep the number of nymphs per cup as low as possible to prevent damage due to aggressive behavior and even cannibalism. Cups should only be filled three quarters full to allow room for ecdysis, and if you think emergence is imminent, you may place a

Styrofoam “peanut” in for additional protection against accidental drowning. If you observe individuals biting the cerci of others, then add a leaf or a few twigs to provide hiding places.



Beating Sheet above with six pack cooler containing adults and/or nymphs.

What you put the cups in is up to you. I bring several coolers to a site, one small 6-pack sized cooler for mobility and at least one large cooler left in the vehicle, with at least an inch of ice. If you're into it like me, you will measure water temperature at the stream to adjust whatever rearing facilities you have at home. An alternate stonefly nymph holding and transportation container was mentioned in the last newsletter and a picture is displayed here:



Dr. Lauck's nymph container with wet foam insert.

Once you have returned to your stonefly lab (or front porch) you have several options to complete the rearing process. I splurged and bought an inexpensive, glass-doored wine refrigerator. If you require professional rearing facilities you will need a Living Stream. To keep within a limited budget, the large cooler will now become the stonefly rearing lab. You will need to keep the cups cool but also exposed to daylight. The beauty of the Living Stream is that it does this, and allows larvae to crawl up into ambient temperatures as well. At this point you should label all the lids with location and date data. As the adults emerge, remove them and their exuviae from the inside of the cup and contain them together (on the back of ID label indicate the date of emergence). If you're not sure of the ID at the stream, then each adult and its exuviae should be contained individually to associate the larval and adult identity. Also, if you are rearing *Isoperla* spp. to adults do not kill them, please ship a few of them live by overnight service to John Sandberg, 6691 Quail Way, Paradise, CA, 95969.



Wine refrigerator with larval rearing chambers inside and fresh stream water beside refrigerator in blue 5 gallon container.

When shipping stonefly nymphs the biggest concern is accidental package mishandling. Having worked in the industry I know this isn't the exception, it's the norm. Nymphs must be kept in containers that hold water, even upside down or sideways. To do this, use two Styrofoam cups, one full sized base and one cut to $\frac{1}{2}$ to $\frac{3}{4}$ sized for the lid. If moss was part of the substrate at the collecting site, collect enough to place a marble-sized ball of it in each cup. Fill base cup half way with stream water; insert half-sized cup-lid as tight as possible and tape entirely closed with duct tape. Drop a test container from waist high: if no water comes out your technique is true. Place ice contained in double Zip Loc bags in the sides of the cooler and duct tape into position. Insert large garbage bag and then place Styrofoam containers inside. Use a generous amount of packing materials (rags, newspaper, etc.) to maintain good spacing between containers. Close garbage bag, tie knot, and tape. Place another layer of packing material over garbage bag and one last double Zip Loc bag of ice if needed. At this point nothing inside the cooler should be able to move in any direction. Close the cooler lid and duct tape closed by completely encircling the cooler. Affix two shipping stickers to the sides of the cooler indicating this side up.

MISCELLANEOUS BUG NOTES

Anecdotal notes, which may be helpful to SAFIT members. The following are notes on critters that are found in northern California but whose distribution in northern California has only recently or has not been published in the available literature. Questions or comments? Do you have a note you would like to submit for this section? Contact Jon Lee at jlee@humboldt1.com.

*Tricorythodes dimorphus** (Ephemeroptera: Leptohyphidae). This mayfly was reported from southern California in the early 1970's and has recently been reported from northern California (Meyer and McCafferty 2008). Late instar male nymphs have very large eyes giving an "alien" appearance. Early instars and female nymphs are difficult to separate from other *Tricorythodes* in northern California. Wayne Fields came up with a character that seems to work to separate

Tricorythodes dimorphus: each thoracic sternum has a subsurface pigmented area centrally between the coxae. It will be interesting to see if this character holds up. The nymphs also appear to be more robust than other *Tricorythodes* known to occur in northern California, but less robust than *Asioplax*. We have seen late instar males from the North Fork Feather River (Plumas Co.), Garcia River (Mendocino Co.), and Trinity River (Humboldt Co.). *Listed as *Homoleptohyphes dimorphus* in the STE.

Ostrocerca foersteri (Plecoptera: Nemouridae). This little stonefly is common in mossy ephemeral creeks and spring seeps in at least Humboldt Co. The adults emerge in the spring. They are probably rare in most bioassessment samples due to the ephemeral nature of the creeks they seem to favor.

Halesochila taylori (Trichoptera: Limnephilidae). D.G. Denning includes this from Glenn Co. in an unpublished work. It is common in at least one spring fed pool in Humboldt Co. The pool receives a substantial input of leaf fall contributing to an organic muck substrate. Immatures build cases of organic matter until the final instar where the case is constructed of fine gravel. Last instar cases can be seen densely packed on submerged twigs during pupation.

LATEST LITERATURE

If you know of any literature or if you yourself have published any papers of interest to the SAFIT membership, please send copies or the citations to Brady Richards (arichards@csuchico.edu) for inclusion in the next issue of the SAFIT Newsletter. Thanks!!

Mollusca

Cowie, R.H., R.T. Dillon, D.G. Robinson, and J.W. Smith. 2009. Alien non-marine snails and slugs of priority quarantine importance in the United States: a preliminary risk assessment. *American Malacological Bulletin* 27 (1-2):113-132.

Haag, W. R. 2009. A hierarchical classification of freshwater mussel diversity in North America. *Journal of Biogeography*:1-15.

Hayes, K.A., R.H. Cowie, and S.C. Thiengo. 2009. A global phylogeny of apple snails: Gondwanan origin, generic relationships, and the influence of outgroup choice (Caenogastropoda: Ampullariidae). *Biological Journal of the Linnean Society* 98 (1):61-76.

Kwong, K.L., R.K.Y. Chan, and J.W. Qui. 2009. The potential of the invasive snail *Pomacea canaliculata* as a predator of various life-stages of five species of freshwater snails. *Malacologia* 51 (2):343-356.

Lysne, S.J. and W.H. Clark. 2009. Mollusc survey of the lower Bruneau River, Owyhee County, Idaho, USA. *American Malacological Bulletin* 27 (1-2):167-172.

Regnier, C., B. Fontaine, and P. Bouchet. 2009. Not knowing, not recording, not listing: numerous unnoticed mollusk extinctions. *Conservation Biology* 23 (5):1214-1221.

Skuza, L., A.M. Labecka, and J. Domagala. 2009. Cytogenetic and morphological characterization of *Corbicula fluminalis* (O. F. Muller, 1774) (Bivalvia: Veneroida: Corbiculidae): taxonomic status assessment of a freshwater clam. *Folia Biologica-Krakow* 57 (3-4):177-185.

Crustacea

Prevorcnik, S., J. Jugovic, and B. Sket. 2009. Geography of morphological differentiation in *Asellus aquaticus* (Crustacea: Isopoda: Asellidae). *Journal of Zoological Systematics and Evolutionary Research* 47 (2):124-131.

Seidel, R.A., B.K. Lang, and D.J. Berg. 2009. Phylogeographic analysis reveals multiple cryptic species of amphipods (Crustacea: Amphipoda) in Chihuahuan Desert springs. *Biological Conservation* 142 (10):2303-2313.

Ephemeroptera

Ogden, T.H., J.L. Gattolliat, M. Sartori, A.H. Staniczek, T. Soldan, and M.F. Whiting. 2009. Towards a new paradigm in mayfly phylogeny (Ephemeroptera): combined analysis of morphological and molecular data. *Systematic Entomology* 34 (4):616-634.

Rebora, M., S. Piersanti, and E. Gaino. 2009. The antennal sensilla of adult mayflies: *Rhithrogena semicolorata* as a case study. *Micron* 40 (5-6):571-576.

Tixier, G., V. Felten, and F. Guerold. 2009. Life cycle strategies of *Baetis* species (Ephemeroptera, Baetidae) in acidified streams and implications for recovery. *Fundamental and Applied Limnology* 174 (3):227-243.

Odonata

Koch, K., M. Quast, and G. Sahlen. 2009. Morphological differences in the ovary of Libellulidae (Odonata). *International Journal of Odonatology* 12 (1):147-156.

Lee, T.E., A.J. Patel, B.W. Johnson, and R.C. Vogtsberger. 2009. Noteworthy records of dragonflies (Odonata: Anisoptera) from Jones and Taylor Counties of central Texas. *Texas Journal of Science* 61 (2):157-160.

Plecoptera

Baumann, R.W. and B.C. Kondratieff. 2009. Studies on *Oemopteryx vanduzeeae* (Claassen, 1937) and a new species in the *O. vanduzeeae* species group (Plecoptera: Taeniopterygidae) from the Pacific Northwest, USA. *Aquatic Insects* 31 (1):195-202.

Baumann, R.W. and B.C. Kondratieff. 2009. Studies on the Holarctic subfamily Brachypterainae (Plecoptera: Taeniopterygidae) using the scanning electron microscope to study male terminalia. *Aquatic Insects* 31 (1):219-230.

Nelson, C.R. and R.W. Baumann. 2009. *Capnia shasta*, a new species in the Californica Group from northwestern California (Plecoptera, Capniidae). *Illiesia* 5 (18):188-194.

Stewart, K.W. and N.H. Anderson. 2009. The life history and nymphal generic character development of *Sweltsa adamantea* Surdick (Plecoptera: Chloroperlidae) in an Oregon summer-dry headwater stream. *Transactions of the American Entomological Society* 135 (1+2):161-173.

Trichoptera

Blinn, D.W. and D.E. Ruitter. 2009. Phenology and distribution of caddisflies (Trichoptera) in Oak Creek, a high-desert perennial stream in Arizona. *Southwestern Naturalist* 54 (2):182-194.

Bueno-Soria, J. 2009. A review of the genus *Ochrotrichia* Mosely (Trichoptera: Hydroptilidae) from Mexico and Central America. *Transactions of the American Entomological Society* 135 (1+2):59-160.

Coleoptera

- Byttebier, B. and P.L.M. Torres. 2009. Description of the preimaginal stages of *Enochrus (Hugoscottia) variegatus* (Steinheil, 1869) and *E. (Methydus) vulgaris* (Steinheil, 1869) (Coleoptera: Hydrophilidae), with emphasis on larval morphometry and chaetotaxy. *Zootaxa* (2139):1-22.
- Culler, L.E. and W.O. Lamp. 2009. Selective predation by larval *Agabus* (Coleoptera: Dytiscidae) on mosquitoes: support for conservation-based mosquito suppression in constructed wetlands. *Freshwater Biology* 54 (9):2003-2014.
- Inoda, T., M. Hasegawa, S. Kamimura, and M. Hori. 2009. Dietary program for rearing the larvae of a diving beetle, *Dytiscus sharpi* (Wehncke), in the laboratory (Coleoptera: Dytiscidae). *Coleopterists Bulletin* 63 (3):340-350.
- Longing, S.D. and B.E. Haggard. 2009. New distribution records of an endemic diving beetle, *Heterosternuta sulphuria* (Coleoptera: Dytiscidae: Hydroporinae), in Arkansas with comments on habitat and conservation. *Southwestern Naturalist* 54 (3):357-361.
- Michat, M.C. and Y. Alarie. 2009. Phylogenetic relationships of *Notaticus* (Coleoptera: Dytiscidae) based on larval morphology. *Annals of the Entomological Society of America* 102 (5):797-808.
- Miller, K.B. 2009. On the systematics of Noteridae (Coleoptera: Adephaga: Hydradephaga): phylogeny, description of a new tribe, genus and species, and survey of female genital morphology. *Systematics and Biodiversity* 7 (2):191-214.
- Miller, K.B., J.R. Gibson, and Y. Alarie. 2009. North American stygobiontic diving beetles (Coleoptera: Dytiscidae: Hydroporinae) with description of *Ereboporus naturaconservatus* Miller, Gibson and Alarie, new genus and species from Texas, U.S.A. *Coleopterists Bulletin* 63 (2):191-202.
- Ruta, R. 2009. Revision of Scirtidae (Insecta: Coleoptera) described by Victor Ivanovitsch Motschulsky. *Zootaxa* (2210):26-50.

Diptera

- Borkent, A. and W.L. Grogan, Jr. 2009. Catalog of the New World biting midges North of Mexico (Diptera: Ceratopogonidae). *Zootaxa* (2273):1-48.

- Elnitsky, M.A., J.B. Benoit, G. Lopez-Martinez, D.L. Denlinger, and R.E. Lee. 2009. Osmoregulation and salinity tolerance in the Antarctic midge, *Belgica antarctica*: seawater exposure confers enhanced tolerance to freezing and dehydration. *Journal of Experimental Biology* 212 (17):2864-2871.
- Niitsuma, H. and C.N. Watson, Jr. 2009. *Bilyjomyia*, a new genus of the tribe Macropelopiini from the Holarctic (Diptera: Chironomidae). *Zootaxa* (2166):57-68.
- Saether, O.A. 2009. *Cryptochironomus* Kieffer from Lake Winnipeg, Canada, with a review of Nearctic species (Diptera: Chironomidae). *Zootaxa* (2208):1-24.
- Taber, S.W. 2009. *Tipula* (*Yamatotipula*) *jacobus* Alexander (Diptera: Tipulidae): description of the female and a midwestern record for a crane fly long perceived as eastern in distribution. *Southwestern Entomologist* 34 (2):151-157.
- Wallace, G.S., W.R. Mabee, and M.D. Combes. 2009. Range extension of a nonindigenous midge, *Polypedilum nubifer* (Diptera: Chironomidae), in North America. *Southeastern Naturalist* 8 (3):559-562.

Miscellaneous

- Buhay, J.E. 2009. "COI-like" sequences are becoming problematic in molecular systematic and DNA barcoding studies. *Journal of Crustacean Biology* 26 (1):96-110.
- Colding, J., J. Lundberg, S. Lundberg, and E. Andersson. 2009. Golf courses and wetland fauna. *Ecological Applications* 19 (6):1481-1491.
- Karatayev, A.Y., L.E. Burlakova, D.K. Padilla, S.E. Mastitsky, and S. Olenin. 2009. Invaders are not a random selection of species. *Biological Invasions* 11 (9 (special issue)):2009-2019.
- Larranaga, A., A. Basaguren, and J. Pozo. 2009. Impacts of *Eucalyptus globulus* plantations on physiology and population densities of invertebrates inhabiting Iberian Atlantic streams. *International Review of Hydrobiology* 94 (4):497-511.
- MacNeil, C. and M. Briffa. 2009. Replacement of a native freshwater macroinvertebrate species by an invader: implications for biological water quality monitoring. *Hydrobiologia* 635 (1):321-327.

- Song, H., J.E. Buhay, M.F. Whiting, and K.A. Crandall. 2008. Many species in one: DNA barcoding overestimates the number of species when nuclear mitochondrial pseudogenes are coamplified. *Proceedings of the National Academy of Science* 105 (38):13486-13491.
- Stubbington, R., A.M. Greenwood, P.J. Wood, P.D. Armitage, J. Gunn, and A.L. Robertson. 2009. The response of perennial and temporary headwater stream invertebrate communities to hydrological extremes. *Hydrobiologia* 630 (1):299-312.
- Virtanen, R., J. Ilmonen, L. Paasivirta, and T. Muotka. 2009. Community concordance between bryophyte and insect assemblages in boreal springs: a broad-scale study in isolated habitats. *Freshwater Biology* 54 (8):1651-1662.

THANK YOU FOR YOUR MEMBERSHIP!

Board of Directors:

Joseph Slusark, President 530.898.4792
D. Christopher Rogers, Vice President 530.383.4798
Raphael Mazor, Treasurer 714.755.3235
Kim Kratz, Secretary 503.231.2155
Scott Johnson, Member at Large 805.643.5261 x11

Editorial Board:

Jon Lee, Newsletter Editor, 707.441.9347 (jlee@humboldt1.com)
Brady Richards, 530.898.4792 (arichards@csuchico.edu)
D. Christopher Rogers, 530.383.4798 (branchiopod@gmail.com)